VIKING PUMP

TECHNICAL SERVICE MANUAL

Viking® In-Line Helical Gear Reducers
Sizes 12, 22, 32, 36, 41, 51, 61, 70, 80, 90, 100

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INTRODUCTION

The illustrations used in this manual are for identification purposes only. This manual deals only with in-line reducers. Speed reducer specifications and recommendations are listed in Catalog Section 615, In-Line Helical Gear Reducers.

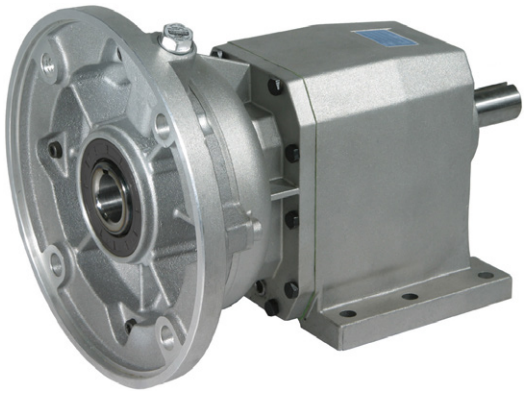


FIGURE 1
SIZE 22 WITH NEMA C-FACE ADAPTOR

DANGER !

Before removing any Viking reducer from its unit be sure: that the driving means (motor, turbine, engine, etc.) has been "locked out" or made non-operational so that it cannot be started while work is being done on the reducer or driven equipment.

Failure to follow above listed precautionary measures may result in serious injury or death.

FIGURE 2
SIZE 32 WITH SOLID INPUT SHAFT

DANGER !

Incorrect installation, operation or maintenance of equipment may cause severe personal injury or death and/or equipment damage.

This information must be read fully before beginning installation, operation or maintenance and must be kept with the reducer. It is suggested that suitably trained or qualified persons perform all installation and maintenance procedures.

CAUTION !

To avoid oxidation and possible seizure of the motor shaft to the NEMA-C or IEC motor flange adaptor bore, apply an anti-seize product to the motor shaft prior to assembly.

STORAGE

Observe the following instructions to ensure correct storage of products:

A) Do not store outdoors, in areas exposed to weather or with excessive humidity.

B) Always place boards, wood, or other material between the products and the floor. The gearbox should not have direct contact with the floor.

C) For long term storage (over 60 days), all machined surfaces such as flanges, shafts and couplings must be protected with a suitable rust inhibiting product (Mobilarma 248 or equivalent).

D) The following measures must be taken when products are stored for a period exceeding 6 months:

- For life lubricated products, the machined areas must be greased to prevent oxidation.
- In addition to above, products originally supplied without oil must be positioned with the breather plug at the highest point and filled with oil.
  Before operating the speed reducer, restore the correct quantity of oil.

LUBRICATION

Gear units are oil-bath lubricated. For applications calling for speed reducers with vertical shaft orientation, oil coverage during operation would not be sufficient to ensure correct lubrication of upper bearings, suitable life lubrication systems must be used.

Speed reducer sizes 12 - 41 are supplied pre-filled with oil and do not have oil filling or level plugs. These long-life lubricated units (using synthetic oil) are capable of operating at an ambient temperature range of -4°F (-20°C) to 122°F (50°C). For temperatures below -4°F (-20°C), contact your authorized distributor or Viking Technical Service.

Speed reducers sizes 51 - 100 require oil filling by the user. Before start-up, fill with the correct quantity of oil using **Table 1**. These quantities are approximate, use the sight glass on the unit to fill accurately. When filled correctly, the oil level should be in the center of the sight glass. Choose the viscosity and type of oil from **Table 2** that is appropriate for the ambient temperature. Viking highly recommends the use of synthetic oil as it maintains viscosity properties over a broader temperature range, shear rates and time. In addition, synthetic oils usually contain additives that prevent foaming and rusting, such as Mobil SHC 600 series, Texaco Synlube CLP series or equivalents. These speed reducers are supplied with oil fill, level, and drain plugs.

Contact your authorized distributor or Viking Technical Service for vertical or other mounting arrangements.

Table 1

Size	Oil Quantity	
	Pints	Liters
12 *	0.95	.45
22 *	1.69	0.80
32 *	3.0	1.4
36 *	3.4	1.6
41 *	4.6	2.2
51	6.6	3.1
61	8.9	4.2
70	14	6.5
80	23	11
90	40	19
100	57	27

* Indicates Life Lubricated

It must be emphasized that these quantities are only indicative and users should check the correct level through the sight glass.

Table 2

Ambient Temperature	32 – 70° F (0 – 20°C)	-4 – 70° F (-20 – 20°C)	70 – 104° F (20 – 40°C)	
Duty Load	Mineral Oil **ISO VG**	Synthetic Oil **ISO VG**	Mineral Oil **ISO VG**	Synthetic Oil **ISO VG**
Light Duty	150	150	220	220
Medium Duty	150	150	320	220
Heavy Duty	220	220	460	320

Periodic Oil Changes

Periodic oil changes are not required for sizes 12 - 41 as they are lubricated for life with synthetic oil. The remaining sizes 51 – 100 are designed for oil lubrication and have oil fill, level, and drain plugs, see **"Plug Locations"**. Users should replace the oil based on **Table 3** and following the directions in **"Lubrication"**.

CAUTION !

Sizes 12, 22, 32, 36, 41 are pre-filled with synthetic lubricant when shipped and require no additional lubricant. These sizes have no oil filling or level plugs. Sizes 51 – 100 require filling with correct amount and type of lubricant prior to use. Operating reducer without the proper type and amount of lubricant for even a short period of time may cause damage.

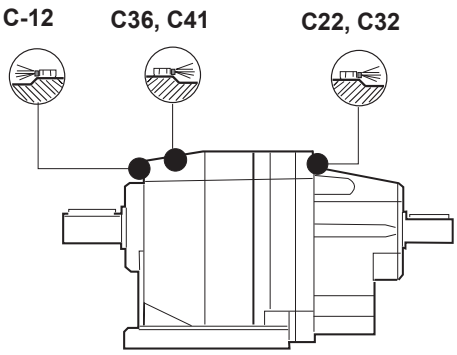
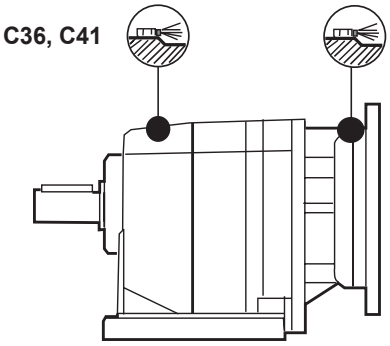
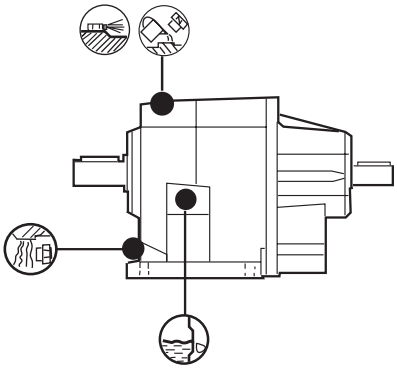
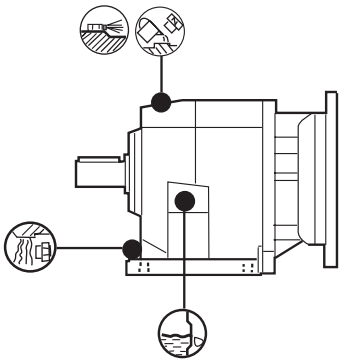
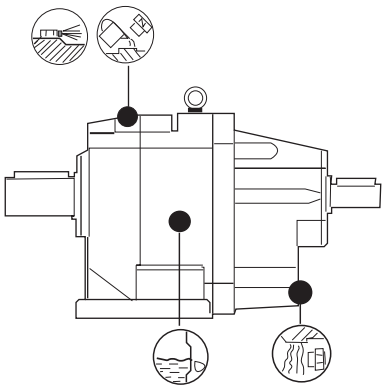
Table 3

Oil Temperature	Oil Change Interval (Hrs)	
	Mineral Oil	Synthetic Oil
<150° F (<65°C)	8000	25000
150-175°F (65 – 80°C)	4000	15000
175–200°F (80–95°C)	2000	12500

PLUG LOCATIONS

The breather plug, fill/breather plug, level plug and drain plug locations are shown below. The C12-C41 reducers are filled and shipped with a synthetic oil and, therefore, do not have fill or level plugs. The C51-C100 reducers must be filled at installation and have a level plug mounted on the side. The plug locations are shown below.

Breather units are not installed at the factory. Remove the breather plug and replace with the breather unit (typically taped to the side of the unit).

	HS	NEMA and IEC
C12- C41		
C51-C61		
C70-C100		**Symbols** **Breather Plug** **Fill / Breather Plug** **Level Plug / Sight Glass** **Drain Plug**

RADIAL AND OVERHUNG LOADS

Input and output shaft of the speed reducer can be subject to loading generated by the type of transmission fitted on the shaft itself. Acceptable overhung load levels can be calculated. Contact your Authorized Distributor or Viking Technical Support for assistance.

TROUBLESHOOTING

Some of the following may help pinpoint the problem:

Bearing temperature is too high:
- Oil level is too low
- Oil is old
- Bearings are worn[1]

Operating temperature is too high:
- Oil level is too high
- Oil is old
- Impurities or contaminates are in the oil

Excessive running noise:
- Gears are damaged[1]
- Bearing axial backlash is too high[1]
- Bearings are worn[1]
- Service load is too high
- Impurities or contaminates are in the oil

Excessive noise at the gear unit mounting:
- Mounting bolts are loose
- Mounting bolts are worn

Oil leakage:
- Oil level is too high
- Casing/coupling seals worn
- Gaskets worn

Gear unit does not run or runs with difficulty:
- Oil viscosity is too high
- Oil level is too high
- Service load is too high

Output shaft does not turn with motor running
- Gears are damaged[1]

[1] Sizes 51-100: Replace gear subassemblies or bearings, see **"Repair Parts"**. Sizes 12-41: Replace entire unit.

REPAIR PARTS

Special tools and training are required to repair multi-reduction gearboxes. Replacement of gears, shafts and bearings, combined with labor makes repairs impractical. Oil seals and gaskets can be easily replaced without special tools or training.

Repair parts for in-line reducers are limited to seal kits consisting of oil seals and gaskets. Table 4 lists the part number for the repair kit for each reducer size and configuration.

Table 4

Size	Input Shaft	Repair Kit No.
12	Solid Shaft	3-462-ILINE12-001
	56C	3-462-ILINE12-002
	143/145TC	3-462-ILINE12-003
	182/184TC	3-462-ILINE12-004
	63 IEC	3-462-ILINE12-005
	71 IEC	3-462-ILINE12-006
	80 IEC	3-462-ILINE12-007
	90 IEC	3-462-ILINE12-008
	100/112 IEC	3-462-ILINE12-009
22	Solid Shaft	3-462-ILINE22-001
	56C	3-462-ILINE22-002
	143/145 TC	3-462-ILINE22-003
	182/184 TC	3-462-ILINE22-004
	63 IEC	3-462-ILINE22-005
	71 IEC	3-462-ILINE22-006
	8O IEC	3-462-ILINE22-007
	90 IEC	3-462-ILINE22-008
	100/112 IEC	3-462-ILINE22-009
32	Solid Shaft	3-462-ILINE32-001
	143/145 TC	3-462-ILINE32-002
	182/184 TC	3-462-ILINE32-003
	80 IEC	3-462-ILINE32-004
	90 IEC	3-462-ILINE32-005
	100/112 IEC	3-462-ILINE32-006
36	Solid Shaft	3-462-ILINE36-001
	143/145 TC	3-462-ILINE36-002
	182/184 TC	3-462-ILINE36-003
	213/215 TC	3-462-ILINE36-004
	80 IEC	3-462-ILINE36-005
	90 IEC	3-462-ILINE36-006
	100/112 IEC	3-462-ILINE36-007
	132 IEC	3-462-ILINE36-008
41	Solid Shaft	3-462-ILINE41-001
	143/145 TC	3-462-ILINE41-002
	182/184 TC	3-462-ILINE41-003
	213/215TC	3-462-ILINE41-004
	80 IEC	3-462-ILINE41-005
	90 IEC	3-462-ILINE41-006
	100/112 IEC	3-462-ILINE41-007
	132 IEC	3-462-ILINE41-008
51	Solid Shaft	3-462-ILINE51-001
	182/184 TC	3-462-ILINE51-002
	213/215 TC	3-462-ILINE51-003
	254/256 TC	3-462-ILINE51-004
	284/286 TC	3-462-ILINE51-005
	100/112 IEC	3-462-ILINE51-006
	132 IEC	3-462-ILINE51-007
	160 IEC	3-462-ILINE51-008
	180 IEC	3-462-ILINE51-009
61	Solid Shaft	3-462-ILINE61-001
	182/184 TC	3-462-ILINE61-002
	213/215TC	3-462-ILINE61-003
	254/256 TC	3-462-ILINE61-004
	284/286 TC	3-462-ILINE61-005
	100/112 IEC	3-462-ILINE61-006
	132	3-462-ILINE61-007
	160	3-462-ILINE61-008
	180	3-462-ILINE61-009
70	Solid Shaft	3-462-ILINE70-001
80	Solid Shaft	3-462-ILINE80-001
90	Solid Shaft	3-462-ILINE90-001
100	Solid Shaft	3-462-ILINE100-001

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IDEX FLUID & METERING

WARRANTY

Viking warrants all products manufactured by it to be free from defects in workmanship or material for a period of one (1) year from date of startup, provided that in no event shall this warranty extend more than eighteen (18) months from the date of shipment from Viking. The warranty period for Universal Seal series pumps ONLY (Universal Seal models listed below) is three (3) years from date of startup, provided that in no event shall this warranty extend more than forty-two (42) months from the date of shipment from Viking.

UNDER NO CIRCUMSTANCES SHALL VIKING BE LIABLE UNDER THIS WARRANTY OR OTHERWISE FOR SPECIAL, INCIDENTAL, INDIRECT, CONSEQUENTIAL OR PUNITIVE DAMAGES OF ANY KIND, INCLUDING, BUT NOT LIMITED TO, LOST OR UNREALIZED SALES, REVENUES, PROFITS, INCOME, COST SAVINGS OR BUSINESS, LOST OR UNREALIZED CONTRACTS, LOSS OF GOODWILL, DAMAGE TO REPUTATION, LOSS OF PROPERTY, LOSS OF INFORMATION OR DATA, LOSS OF PRODUCTION, DOWNTIME, OR INCREASED COSTS, IN CONNECTION WITH ANY PRODUCT, EVEN IF VIKING HAS BEEN ADVISED OR PLACED ON NOTICE OF THE POSSIBILITY OF SUCH DAMAGES AND NOTWITHSTANDING THE FAILURE OF ANY ESSENTIAL PURPOSE OF ANY PRODUCT.

THIS WARRANTY IS AND SHALL BE VIKING'S SOLE AND EXCLUSIVE WARRANTY AND SHALL BE IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ALL WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NON-INFRINGEMENT ALL OF WHICH OTHER WARRANTIES ARE EXPRESSLY EXCLUDED.

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